

WHAT IS CLAIMED IS:

1. A fiber-reinforced article comprised of at least two plies wherein each of said plies comprises (a) rubber and (b) cord made from melt-spinnable, non-metallic, multifilament fiber, said cord having

5 a twist multiplier of less than or equal to about 375,
a stress at 1% strain greater than or equal to about 1.7 grams/denier, and
an initial compressive modulus greater than or equal to about 7 grams/denier,
and

10 said at least two plies having a fiber orientation angle of greater than or equal to about 23° ^{cord} with respect to the longitudinal direction of the article

15 2. The article of claim 1 wherein said twist multiplier is less than or equal to about 310.

15 3. The article of claim 1 wherein said initial compressive modulus is greater than or equal to about 9 grams per denier.

20 4. The article of claim 1 where said fiber orientation angle of said at least two plies is greater than or equal to about 26° .

25 5. The article of claim 1 comprising three plies wherein two plies have said fiber ^{cord} orientation angle of about 30° and the third ply has a fiber orientation angle of about 0° .

25 6. The article of claim 5 wherein said third ply has said cord at 4 to 20 ends per inch.

30 7. The article of claim 1 comprising four plies wherein two plies have said fiber ^{cord} orientation angle of about 23° and two plies have a fiber orientation angle of about 45° .

30 8. The article of claim 7 wherein said two inner plies have said cord at 4 to 20 ends per inch.

35 9. The article of claim 1 wherein said cord is made from polyethylene naphthalate.

10. The article of claim 1 having fiber reinforcement in a third dimension.
11. The article of claim 10 wherein said third dimension of reinforcement comprises stitches or folds.
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~~12. The article of claim 11 wherein said stitches comprise continuous chain, zigzag or cross-stitch.~~
13. The article of claim 11 wherein said folds form the edges of the longitudinal direction of the composite.
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*said third dimension of reinforcement comprising
folds
and*
*Sub
01*
~~14. The article of claim 11 wherein said third dimension is formed by braiding.~~
15. The article of claim 1 wherein said article has substantially no cut cord ends along its longitudinal edges.
16. The article of claim 1 wherein said cord further comprises said cord having a denier per filament of greater than or equal to about 2.
20. 17. The article of claim 1 said cord further comprises said cord having an initial tensile modulus of at least about 165 grams per denier.
18. The article of claim 1 wherein said article has an in-plane shear modulus of at least about 730 pounds-force per inch.
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29. 19. The article of claim 1 wherein said article has an in-plane shear modulus of at least about 830 pounds-force per inch.
30. 20. The article of claim 1 wherein said article has a fatigue of at least about 2700 cycles to failure.
21. The article of claim 1 wherein said article has a fatigue of at least about 5500 cycles to failure.
35. 22. The article of claim 1 wherein said article is a tire belt.

WHAT IS CLAIMED IS:

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1. A fiber-reinforced article comprised of at least two plies wherein each of said plies comprises (a) rubber and (b) cord made from melt-spinnable, non-metallic, multifilament fiber, said cord having

5 a twist multiplier of less than or equal to about 375,
a stress at 1% strain greater than or equal to about 1.7 grams/denier, and
an initial compressive modulus greater than or equal to about 7 grams/denier,
and
10 said at least two plies having a fiber orientation angle of greater than or equal to about 23°.

2. The article of claim 1 wherein said twist multiplier is less than or equal to about
310.

15 3. The article of claim 1 wherein said initial compressive modulus is greater than or
equal to about 9 grams per denier.

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20 4. The article of claim 1 wherein said fiber orientation angle of said at least two plies is
greater than or equal to about 30°.

25 5. The article of claim 1 comprising three plies wherein two plies have said fiber
orientation angle of about 30° and the third ply has a fiber orientation angle of about
0°.

6. The article of claim 5 wherein said third ply has said cord at 4 to 20 ends per inch.

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30 7. The article of claim 1 comprising four plies wherein two plies have said fiber
orientation angle of about 23° and two plies have a fiber orientation angle of about 45°.

8. The article of claim 7 wherein said two inner plies have said cord at 4 to 20 ends
per inch.

9. The article of claim 1 wherein said cord is made from polyethylene naphthalate.

10. The article of claim 1 having fiber reinforcement in a third dimension.

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11. The article of claim 10 wherein said third dimension of reinforcement comprises
stitches or folds.

12. The article of claim 11 wherein said stitches comprise continuous chain, zigzag or
cross-stitch.

13. The article of claim 11 wherein said folds form the edges of the longitudinal
10 direction of the composite.

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14. The article of claim 11 wherein said third dimension is formed by braiding.

15. The article of claim 1 wherein said article has substantially no cut cord ends along
its longitudinal edges.

16. The article of claim 1 wherein said cord further comprises said cord having a
denier per filament of greater than or equal to about 2.

20 17. The article of claim 1 said cord further comprises said cord having an initial tensile
modulus of at least about 165 grams per denier.

18. The article of claim 1 wherein said article has an in-plane shear modulus of at least
about 730 pounds-force per inch.

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19. The article of claim 1 wherein said article has an in-plane shear modulus of at least
about 830 pounds-force per inch.

20. The article of claim 1 wherein said article has a fatigue of at least about 2700
30 cycles to failure.

21. The article of claim 1 wherein said article has a fatigue of at least about 5500
cycles to failure.

35 22. The article of claim 1 wherein said article is a tire belt.

23. A tire comprising a belt in accordance with claim 1.

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5 24. A tire comprising a belt in accordance with claim 9.

25. A method of making a tire comprising the step of:
incorporating the fiber-reinforced article of claim 1 therein.

26. A method of making the article of claim 13 comprising the step of:
10 folding a unidirectional composite sheet (79) in a spiral manner to produce a
composite having continuous fiber reinforcement and uncut, folded edges.

27. A method of forming an annular object comprising the steps of:
folding the article of claim 13 into a ring shape,
15 overlapping the ends (107 and 109) of said article,
causing one of said ends to have a notch (111) and the second of said ends to
have a reciprocal flap (113), and
folding said flap into said notch,
wherein said annular object has no cut cord ends along its circumferential edges.

20 28. A method of making the article of claim 12 comprising the step of:
stitching together said two or more plies.